Alberta
HUMAN RESOURCES AND EMPLOYMENT

the people & workplace department

September 2001

Occupational Injuries and Diseases in Alberta

Oilfield Maintenance and Construction 1996 to 2000

Upstream Oil and Gas Sub-Sector #2

102-07172/

TABLE OF CONTENTS

1. Introduction 1

2. Sub-Sector Description 2

3. Lost-Time Claim Rates and Duration Rates 4
3.1 LTC Rates by Size of Employer: 2000 4

4. Analysis of the Lost-Time Claims 5
4.1 Nature of Injury 5
4.2 Duration of Disability 6
4.3 Type of Event/Exposure 7
4.4 Part of Body Injured 8
4.5 Source of Injury 9

5. Characteristics of the Injured Worker 10
5.1 Occupation of the Injured Worker 10
5.2 Age of injured Worker 11
5.3 Length of Time Employed 11
5.4 Gender of Injured Worker 11

6. Cost of Claims and Employer Premiums 12

7. Occupational Fatalities 13

8. OHS Investigated Occupational Fatalities: 1996 to 2000 14

Appendix A: Terms, Definitions, and Formulas 15

Appendix B: Upstream Oil and Gas 2000 Industry Codes 16

1. Introduction

The Mission of Alberta Human Resources and Employment

Alberta Human Resources and Employment's mission is to foster safe and healthy workplaces. Workplace Health and Safety works within the continuum of services provided by Alberta Human Resources and Employment. Its focus is on the development and implementation of strategies and initiatives aimed at meeting the department's goal that Alberta will have a fair, safe and healthy work environment. To this end, Alberta Human Resources and Employment recognizes that monitoring workplace health and safety will help to ensure that primary concerns are actively managed and that resources are directed where needed.

This report summarises the lost-time injuries and disease descriptions, characteristics of the injured worker and the risk of injury to workers in Alberta's upstream oil and gas industries for the years 1996 to 2000. Cost of the injuries and revenue in terms of total premiums paid by employers is also presented. Finally, a summary of occupational fatalities accepted by the WCB for compensation and brief descriptions of fatalities investigated by Workplace Health and Safety are also provided.

The purpose of this report is to provide government, employers, workers and health and safety officers in upstream oil and gas industries with information about the industry key health and safety issues.

Description of Upstream Oil and Gas Industries

The upstream oil and gas industries can be subdivided into the following sub-sectors.
Exploration, Oilfield Maintenance and Construction, Well Servicing with Service Rigs and Power Swivels, Drilling of Oil and Gas Wells, Oilfield Downhole and Other Services, Tar Sands, Petroleum Producers, and Oilfield Trucking Services.

The next section gives the descriptions of the Oilfield Maintenance and Construction sub-sector.

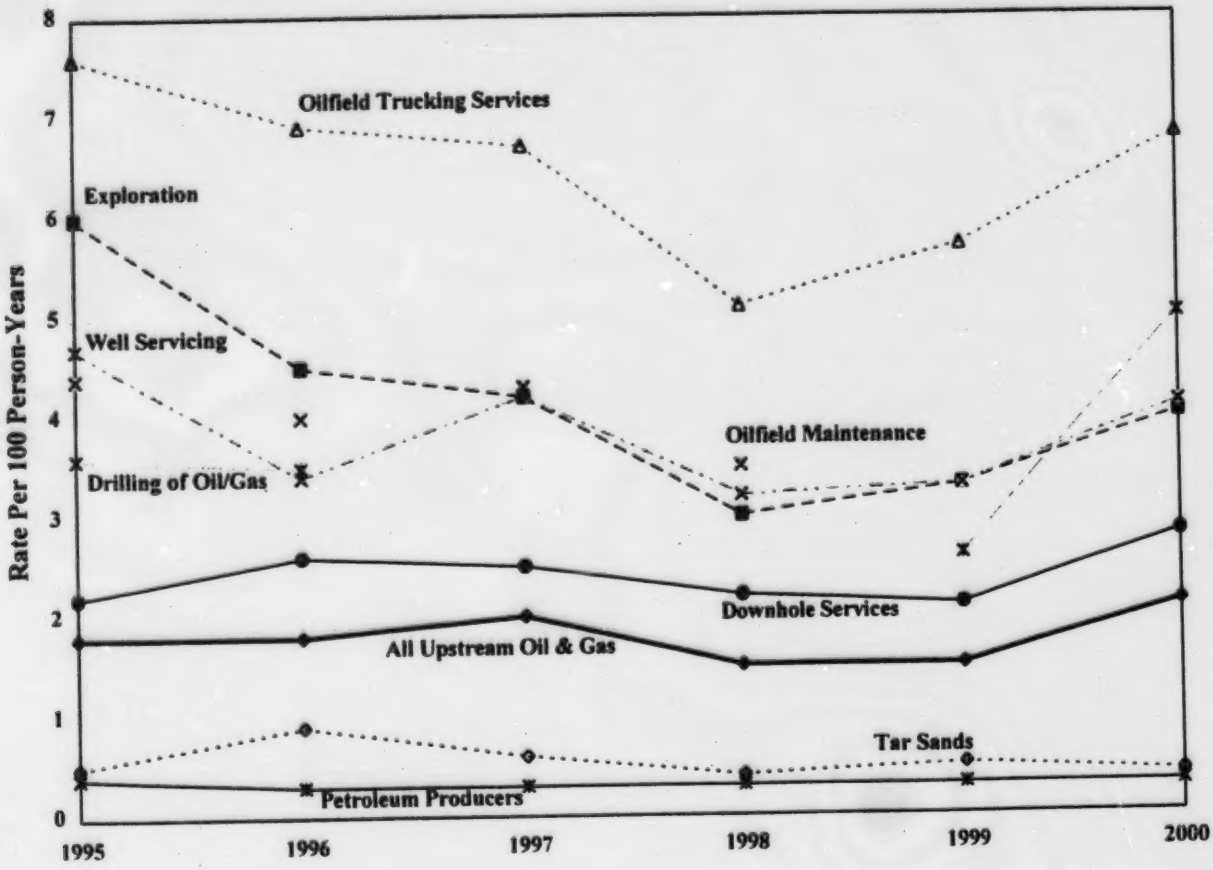
2. Sub-Sector Description

Sub-Sector # 2: Oilfield Maintenance & Construction

Oilfield Construction and/or Maintenance (Upstream of Processing Plants)(Industry # 06304)
This classification describes general contracting business that undertake turn-key construction and maintenance projects at facilities and lease sites upstream of gas plants.

Businesses may construct oil and gas wells, battery tanks, and compressor stations upstream of the processing facility. Construction activities may extend into ties-ins, installing/removing pump-jacks, dehydrators, and secondary construction activities of installing fences and gates. Maintenance activities may include painting, welding, pipefitting, cleaning oil spills, clearing a lease road, and maintaining the grounds in and around the site.

Lost-Time Claim Rates
Upstream Oil & Gas Subsectors
Alberta: 1995-2000



3. Lost-Time Claim Rates and Duration Rates

06304-Oilfield Maintenance and Construction

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
1996	778	$1,164,171	4,019	5,874	146	161	4.0
1997	858	$1,871,160	5,264	8,100	154	225	4.3
1998	901	$903,554	4,839	6,575	136	168	3.5
1999	920	$527,283	4,193	6,577	157	138	3.3
2000	925	$1,039,838	4,286	6,301	147	176	4.1

3.1 LTC Rates by Size of Employer: 2000

Size of Employer	# of Accounts	LTCs	Person - Years	LTC Rate
A: 0<= PYs < 1	527	15	234	6.4
B: 1<= PY < 5	236	12	528	2.3
C: 5 <= PYs < 10	67	23	468	4.9
D: 10 <= PYs < 20	57	37	797	4.6
E: 20 <= PYs < 40	17	27	447	6.0
F: 40 <= PYs < 100	1	41	894	4.6
G: PYs >=100	5	20	917	2.2
H: Invalid	1	1	N/A	N/A
Total	925	176	4,286	4.1

4. Analysis of the Lost-Time Claims

4.1 Nature of Injury

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
SPRAIN, STRAIN, TEARS	50	93	47	42	58	290	33.4
FRACTURE/DISLOCATION	30	51	43	33	33	190	21.9
SURFACE WOUNDS, BRUISES	29	27	28	17	24	125	14.4
OTHER TRAUMATIC INJURY/DISEASE	10	9	17	18	24	78	9.0
OPEN WOUNDS	16	20	12	11	16	75	8.6
SYSTEMATIC DISEASES, DISORDERS	8	12	7	10	13	50	5.8
NATURE - UNS	9	7	4	5	2	27	3.1
BURNS	7	4	9	2	4	26	3.0
MULTIPLE DISEASE/DISORDERS	2	1	1	.	.	4	0.5
SYMPTOMS, SIGN/ILLNESS	.	1	.	.	1	2	0.2
OTHER DISEASE/DISORDERS	.	.	.	.	1	1	0.1
Total	161	225	168	138	176	868	100.0

4.2 Duration of Disability

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
01 - 05 DAYS LOST	48	81	48	29	45	251	28.9
06 - 10 DAYS LOST	23	28	21	15	24	111	12.8
11 - 15 DAYS LOST	13	14	16	10	17	70	8.1
16 - 20 DAYS LOST	9	11	8	10	12	50	5.8
21 - 30 DAYS LOST	5	13	16	13	13	60	6.9
31 - 40 DAYS LOST	10	15	10	4	11	50	5.8
41 - 50 DAYS LOST	10	7	8	7	7	39	4.5
51 OR MORE DAYS LOST	38	51	35	47	41	212	24.4
DAYS LOST-UNSPECIFIED	5	5	6	3	6	25	2.9
Total	161	225	168	138	176	868	100.0

4.3 Type of Event/Exposure

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
UNKNOWN	12	8	9	12	11	52	6.0
STRUCK BY OBJECTS	26	49	43	25	33	176	20.3
OVEREXERTION	35	47	28	32	33	175	20.2
CAUGHT IN OBJECTS	14	26	18	12	23	93	10.7
BODILY REACTION	22	15	17	10	14	78	9.0
FALL TO LOWER LEVEL	8	14	15	7	8	52	6.0
TRANSPORTATION ACCIDENTS	10	17	7	10	8	52	6.0
FALL ON SAME LEVEL	8	12	6	10	12	48	5.5
EXPOSURE TO HARMFUL SUBSTANCES	10	9	11	3	10	43	5.0
STRUCK AGAINST OBJECTS	3	9	7	4	9	32	3.7
RUBBED OR ABRADED	8	6	3	5	4	26	3.0
OTHER FALLS	3	9	2	2	5	21	2.4
FIRES AND EXPLOSIONS	2	1	.	1	2	6	0.7
REPETITIVE MOTIONS	.	1	1	3	1	6	0.7
OTHER BODILY REACTION/EXERTION	.	.	1	2	2	5	0.6
OTHER CONTACT WITH/ OBJECT/EQUIP.	.	2	.	.	.	2	0.2
OTHER ASSAULTS/VIOLENT	.	.	.	.	1	1	0.1
Total	161	225	168	138	176	868	100.0

4.4 Part of Body Injured

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
BACK	40	56	32	35	35	198	22.8
OTHER TRUNK	14	28	21	25	21	109	12.6
FINGER(S)	9	27	26	14	23	99	11.4
LEG(S)	22	19	19	16	23	99	11.4
ANKLE(S) & FOOT(FEET)-NOT TOES	21	26	17	14	19	97	11.2
HAND(S)	15	16	19	7	8	65	7.5
EYE(S)-OPTIC NERVE,VISION	12	11	8	5	15	51	5.9
OTHER HEAD	10	18	8	4	3	43	5.0
OTHER UPPER EXTREMITIES	6	5	8	8	12	39	4.5
MULTIPLE BODY PARTS	5	4	3	6	6	24	2.8
NECK	4	9	4	.	2	19	2.2
OTHER LOWER EXTREMITIES	1	5	2	4	7	19	2.2
UNKNOWN	2	1	.	.	1	4	0.5
BODY SYSTEMS	.	.	1	.	.	1	0.1
OTHER BODY PARTS	.	.	.	.	1	1	0.1
Total	161	225	168	138	176	868	100.0

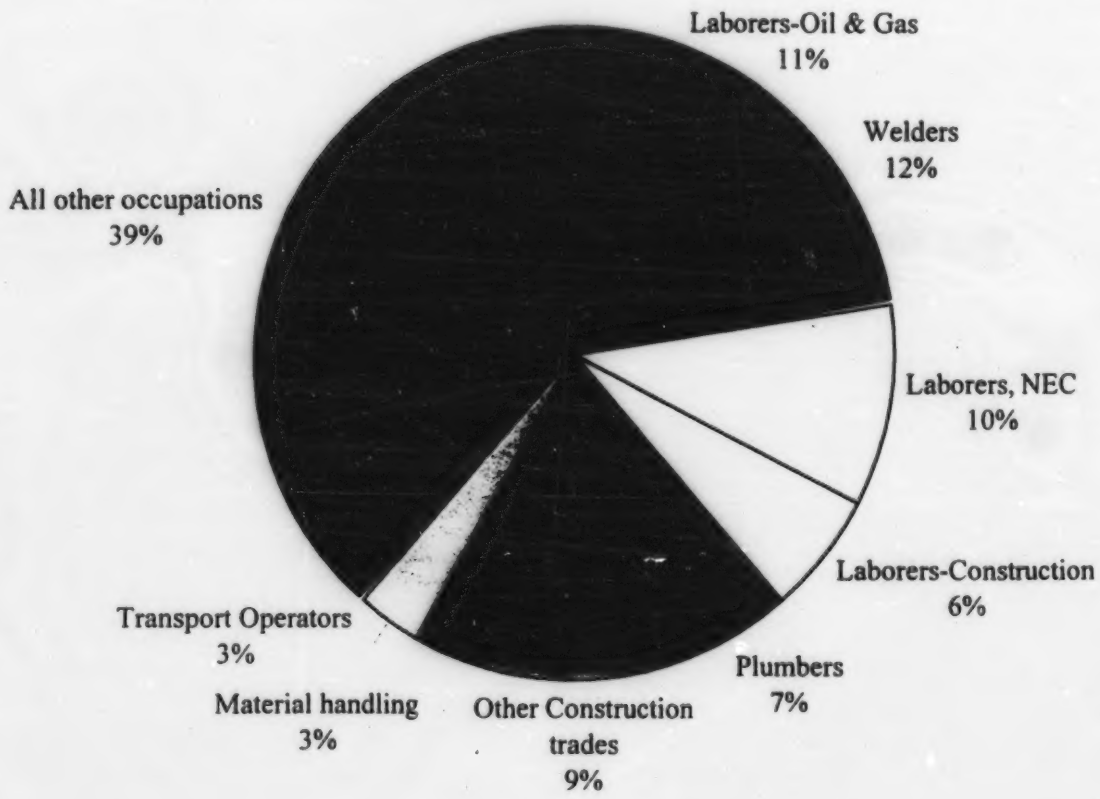
4.5 Source of Injury

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
UNKNOWN	21	24	24	18	31	118	13.6
PARTS & MATERIALS	43	72	35	38	50	238	27.4
STRUCTURES/SURFACES	18	29	20	16	22	105	12.1
PERSONS-INJURED WORKER	21	16	19	12	16	84	9.7
VEHICLES	9	23	9	15	8	64	7.4
HANDTOOLS-UNPOWERED	8	11	20	8	8	55	6.3
MACHINERY	10	16	10	5	9	50	5.8
OTHER SOURCES	16	4	8	6	13	47	5.4
CONTAINERS	4	5	7	9	7	32	3.7
HANDTOOLS-POWERED	7	5	2	3	5	22	2.5
OTHER TOOLS/EQUIPMENT	1	9	4	2	1	17	2.0
MINERAL-METALS/NONMETALS	2	3	3	2	2	12	1.4
CHEMICAL/CHEMICAL PRODUCTS	1	3	2	1	2	9	1.0
FURNITURE & FIXTURES	.	4	1	1	.	6	0.7
OTHER PLANTS/ANIMALS/MINERALS	.	1	3	1	1	6	0.7
PLANTS & ANIMALS	.	.	.	1	1	2	0.2
PERSONS-NOT THE INJURED WORKER	.	.	1	.	.	1	0.1
Total	161	225	168	138	176	868	100.0

5. Characteristics of the Injured Worker

5.1 Occupation of the Injured Worker

Occupation of the Injured Worker
Alberta:1996-2000



5.2 Age of injured Worker

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
15-19 YEARS	12	28	19	11	18	88	10.1
20-24 YEARS	28	52	40	33	39	192	22.1
25-34 YEARS	59	64	50	35	52	260	30.0
35-44 YEARS	41	47	33	31	35	187	21.5
45-54 YEARS	15	21	19	19	21	95	10.9
55-64 YEARS	6	10	7	5	10	38	4.4
65 YRS AND OVER	.	.	.	3	1	4	0.5
AGE-UNSPECIFIED	.	3	.	1	.	4	0.5
Total	161	225	168	138	176	868	100.0

5.3 Length of Time Employed

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
A. LESS THAN 1 MONTH	21	41	24	20	38	144	16.6
B. 1 MONTH TO < 6 MONTHS	34	60	34	34	39	201	23.2
C. 6 MONTHS TO < 1 YEAR	14	23	17	13	19	86	9.9
D. 1 YEAR OR MORE	50	64	56	43	43	256	29.5
E. TIME-UNSPECIFIED	42	37	37	28	37	181	20.9
Total	161	225	168	138	176	868	100.0

5.4 Gender of Injured Worker

LOST-TIME CLAIMS ALBERTA: 1996 TO 2000	OCCURRENCE YEAR					Total	
	1996	1997	1998	1999	2000	Number	Percent
MALE	155	211	159	131	164	820	94.5
FEMALE	4	7	7	3	7	28	3.2
GENDER-UNSPECIFIED	2	7	2	4	5	20	2.3
Total	161	225	168	138	176	868	100.0

6. Cost of Claims and Employer Premiums

Sub-Sector 2-Oilfield Maintenance & Construction

	Occurrence Year				
	1996	1997	1998	1999	2000
Transaction Year					
1996	$1,135,327				
1997	$340,048	$1,091,982			
1998	$389,139	$900,815	$762,644		
1999	$275,000	$911,504	$575,610	$468,653	
2000	$52,843	$342,066	$151,048	$761,428	$836,988
Total cost	$2,192,356	$3,246,366	$1,489,302	$1,230,081	$836,988
Total Premiums	$4,400,134	$5,463,586	$4,227,471	$2,656,055	$3,434,828

The above claim cost and employer premiums are for the five-year period 1996 through 2000. The data are as of May 4, 2001.

The cost of claim amount reflects only paid cost on claims that have occurred in the five-year period. The claim costs are tracked by occurrence year and the year that the costs were transacted.

The premiums are the total of all premiums paid by employers in each year.

7. Occupational Fatalities

An occupational fatality is the death of a worker that results from a work-related incident or exposure. Alberta Human Resources and Employment classifies occupational fatalities into three general types: motor vehicle incident, workplace incident and occupational diseases. Each is described in detail below.

Motor Vehicle Incident

Motor vehicle incidents typically involve highway vehicles operating on public roads in which the fatally injured worker was either the driver or a passenger. This category also includes fatalities involving aircraft crashes, train crashes, helicopter crashes, etc.

Workplace Incident

Fatal workplace incidents consist of cases in which the worker dies at a work site, or as a result of injuries sustained at a work site. It is this type of fatality that Alberta Human Resources and Employment may be responsible for investigating.

Occupational Diseases

Occupational disease fatalities consist mostly of recognized occupational disease, that is, disease known to be primarily or exclusively work-related (e.g. asbestosis, black lung disease). Occupational diseases are frequently diagnosed many years after the initial or crucial exposure to the toxic substance, and in such cases it is very difficult to determine when the fatal exposure occurred. Thus, the occupational disease category should not be interpreted to reflect present work site hazardous conditions or exposures.

Each year the Workers' Compensation Board (WCB) accepts some occupational fatality claims for compensation. Occupational fatality claims that were accepted in a particular year may include fatalities from prior years.

Description of Oilfield Maintenance and Construction Workplace Fatalities Accepted by the WCB[1]

YEAR	Occupational Diseases		Motor Vehicle Incidents		Workplace Incidents		Total	
	N	%	N	%	N	%	N	%
1996	0	0	3	100.0	0	0	3	100
1997	0	0	1	50.0	1	50.0	2	100
1998	1	33.3	1	33.3	1	33.3	3	100
Total	1	12.5	5	62.5	2	25.0	8	100

[1] There were no fatalities accepted by WCB in 1999 and 2000 for Oilfield Maintenance and Construction

8. OHS Investigated Occupational Fatalities: 1996 to 2000

YEAR:	1998	FILE:	0891
OCCUPATION:	Apprentice Welder	AGE:	24
INDUSTRY:	Oil Field Construction and/or Maintenance (Upstream of Processing Plants)		
EXPERIENCE:	1.5 years		

DESCRIPTION: A three person crew was in the process of cutting steel pilings for the installation of an above ground pipeline at the Primrose Lake construction site. The piles had been driven into place in pairs. The piles at the incident scene were long, so a backhoe was required to hold the piles while they were being cut. One of the poles had been cut and pulled down. They were preparing to cut the second pile when the welder appeared in front of the piling just as the backhoe bucket was swinging back to hold the pile. The welder was hit on the right side of his head with the bucket of the backhoe resulting in fatal injures.

Appendix A: Terms, Definitions, and Formulas

Lost-Time Claim

A lost-time claim (LTC) is a claim for an occupational injury or disease, which disables the worker beyond the day of injury. Included are claims for which wages compensation are paid, permanent disability claims, fatalities, and cases in which the injured worker is assigned light duties or other modified work.

Person-Years

Person-year estimates are calculated from wage and payroll data provided by account holders to the WCB. Alberta Human Resources and Employment uses these data to estimate an average industry wage, and uses the average industry wage and employer payroll data to estimate person-years for each employer and each industry. One person-year is equivalent to one full-time worker working for one year, and can be assumed to equal 2,000 hours worked.

LTC Rate

The lost-time claim (LTC) rate is calculated by dividing the number of lost-time claims by the person-year estimate, and multiplying the result by 100. The LTC rate represents the probability or risk of disabling injury or disease to a worker during a period of one-year work. Comparisons of LTC rates between industries, or between years, can be used to indicate increases, decreases, or differences in this risk.

$$\text{LTC Rate} = \frac{\text{Number of LTCs X 100}}{\text{Estimated Person-years}}$$

Duration (Days Lost)

The duration of disability is the number of days following the injury or disease for which the worker was disabled, and unable to perform normal work duties. This information is obtained for this report from data on compensation days paid on each claim from WCB. Alberta Human Resources and Employment obtains these data on March 31 of the year following the claim year, and does not update the information, even though many injured workers continue to be disabled beyond this date. As a result, the duration information reported here underestimates the true impact of lost-time injury and disease.

Duration Rate

The duration rate is calculated by dividing the number of workdays lost (disability days) by the person-year estimate, and multiplying by 100. The result is expressed as days lost per 100 person-years worked, and indicates, in part, the economic impact of occupational injury and disease. Duration rates are not recommended as reliable indicators of full economic cost. In addition, readers are warned that duration rates are highly unstable when based on only a few lost-time claims; it is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.

$$\text{Duration Rate} = \frac{\text{Disability Days X 100}}{\text{Estimated Person-Years}}$$

WCB Accepted Fatality

An occupational fatality is the death of a worker which resulted from a work-related incident or exposure and which has been accepted by the WCB for compensation. A fatality is counted in the year it is accepted.

NEC

Means 'Not Elsewhere Classified'.

UNS

Means 'Unspecified'.

Appendix B: Upstream Oil and Gas 2000 Industry Codes

Sub-Sector 1: **Exploration**
Industries: 09200~Seismic Geophysical/Mineral Exploration
09201~Shot Hole Drilling

Sub-Sector 2: **Oilfield Maintenance and Construction**
Industries: 06304~Oilfield Construction and/or Maintenance

Sub-Sector 3: **Well Servicing With Service Rigs**
Industries: 09903~Well servicing with Service Rigs including Power Swivels

Sub-Sector 4: **Drilling of Oil and gas Wells**
Industries: 09600~Drilling of Oil & Gas Wells

Sub-Sector 5: **Downhole & Other Oilfield Services**
Industries 06305~Field Production Operators
06306~Vacuum Removal of Waste
09900~Mud Logging
09902~Pressure Cleaning Services
09904~Rathole Drilling and Rig Anchoring
09911~Oilfield Downhole Services
09915~Well Casing Services
09921~Servicing Christmas Trees On Oil Wells
09927~Liquid Waste Treatment & Disposal

Sub-Sector 6: **Tar Sands**
Industries: 06600~Mining & Processing of Bituminous Sand
06601~Research/Development, Oil Sands and Heavy Oil Recovery

Sub-Sector 7: **Oil & Gas Exploration/Development**
Industries: 06300~Oil and Gas Exploration & Development-Upstream Operations

Sub-Sector 8: **Oilfield Trucking Services**
Industries: 50720~Oilfield Trucking Services

For further information contact:

Alberta Human Resources and Employment
Performance and Applied Research Branch
2nd Floor, 10808 – 99 Avenue
Edmonton, Alberta
T5K 0G2

Phone: 780-427-8531
Fax: 780-422-5070

Alberta Human Resources and Employment website:
http://www.gov.ab.ca/hre

Alberta Workplace Health and Safety website:
http://www.whs.gov.ab.ca